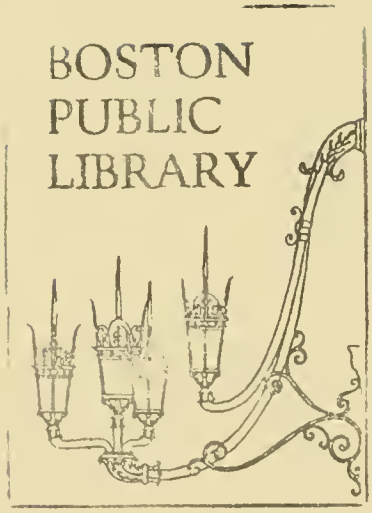
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SOUTH END MEDICAL AREA PLANNING STUDY

PHASE 1 REPORT:

EXISTING TRANSPORTATION CONDITIONS, PROBLEMS AND OPPORTUNITIES

prepared for:

THE UNIVERSITY HOSPITAL
75 East Newton Street
Boston, Massachusetts 02118

prepared by:

HOWARD/STEIN-HUDSON ASSOCIATES
38 Chauncy Street
Boston, Massachusetts 02111

August, 1988

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BACKGROUND AND OBJECTIVES

The South End Medical Area Planning Study Area is defined as that portion of the South End and Lower Roxbury bounded to the west by Washington Street, Melnea Cass Boulevard to the south, the Southeast Expressway to the east, and to the north by Herald Street. (Refer to Figure 1.) The proximity of the study area, and in particular the South End Medical Area, to downtown Boston, Logan International Airport and the regional highway network poses unique problems and opportunities in terms transportation-related issues. Both residents and employers have always been concerned with parking availability, transit service and traffic congestion.

The location of the South End provides unique opportunities for the area in terms of future land use and transportation access. Major past, present and future public initiatives, along with appreciating land values, have produced pressures on the South End neighborhood that need to be addressed via a master planning effort. Furthermore, the multitude of public and private interests in the area, and the array of development projects now in the planning stages, present an excellent opportunity to shape the future of the South End Medical Area in a positive way.

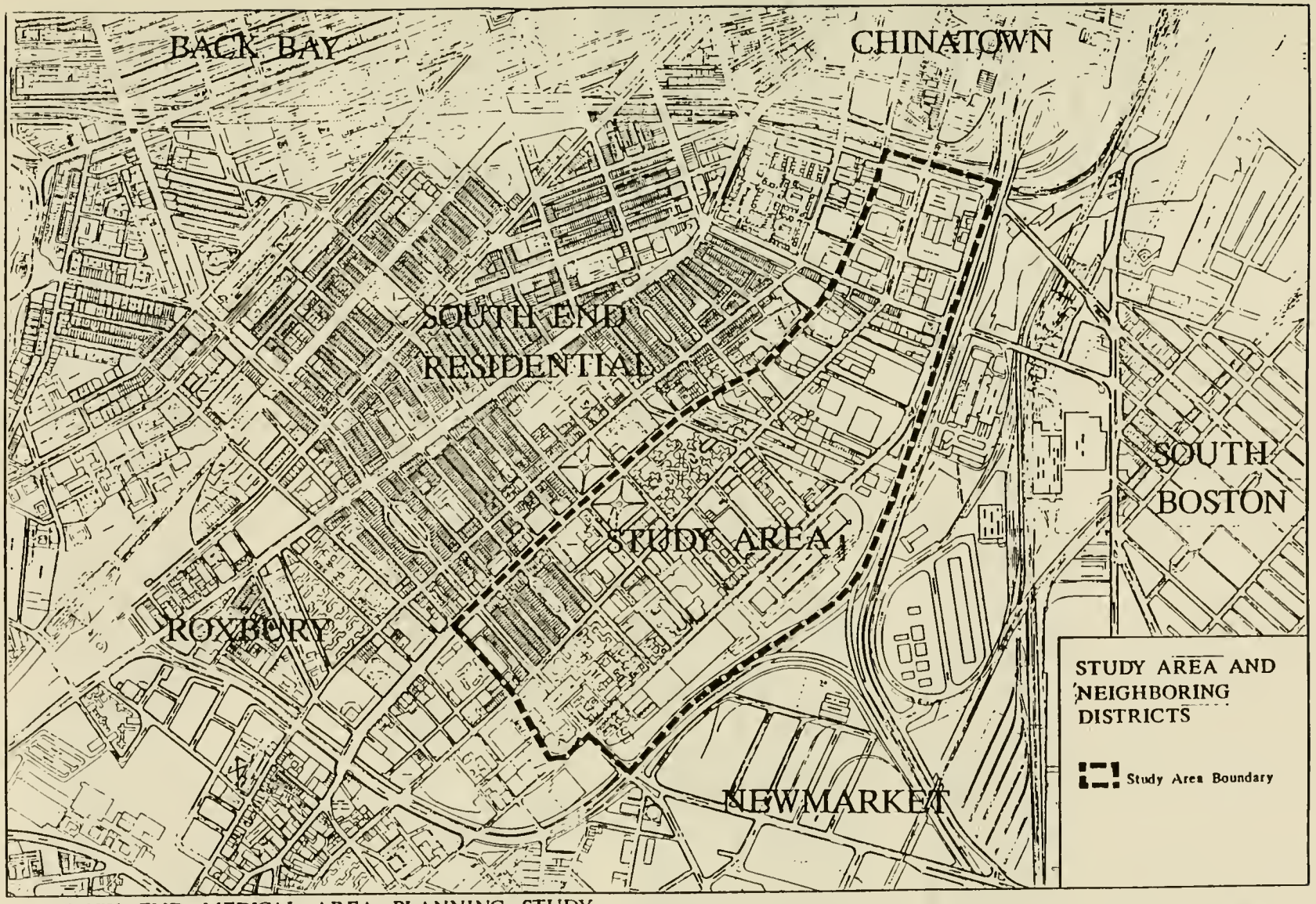
Future land use and related transportation access needs in the area call for a master planning initiative that will give perspective to this complex and changing situation. The analysis should be influenced by the community, business, institutional and residential, as well as the City. The master plan will provide the framework to address changes in land use, traffic circulation, parking demand, public transportation, new construction and the rehabilitation of existing structures that can profoundly affect the quality of life in the neighborhood.

The master planning effort now underway has been initiated in light of these changes and needs. This memorandum presents the findings of the first phase of work on the transportation aspects of the master plan, in particular, the identification and analysis of existing transportation conditions, problems and opportunities.

The following sections address, in turn, the existing transportation conditions, including regional access, public transit, parking supply, traffic flows and pedestrian activity. The next section of the memorandum reports on employee and visitor travel patterns, including the trip distribution, mode split and parking demand. The memorandum concludes with a discussion of transpor-

tation problems and opportunities facing the area, including long term needs and the impacts and implications of the Central Artery/Third Harbor Tunnel project.

The material presented herein will serve as input to the next phases of work on the study. The major efforts include assessing the transportation effects of the various development plans, including the levels of added traffic to be generated and the needs for intersection, circulation, transit, pedestrian and parking improvements as a result of the developments. Another key upcoming step will be to determine the effects of major public infrastructure projects in the area, including those noted above, and how they will change access to and within the study area; what impacts will result on the transportation network of the area; and recommended changes to the plans themselves, or corresponding changes to the local street system, to help achieve the objectives of the study area.



SOUTH END MEDICAL AREA PLANNING STUDY

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Consultants:
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FIGURE 1

EXISTING CONDITIONS

Regional Access

Geographically, the South End Medical Area is located immediately adjacent to two of the major regional highway links within the city -- the Southeast Expressway (Route 3/I-93) and the Massachusetts Turnpike (Route I-90). Figure 1 indicates the proximity of the study area to these, among other, roadway facilities.

The Southeast Expressway provides direct access to the South Shore and other locations south of the City. To the north, the Southeast Expressway provides direct links to the Central Artery and the Massachusetts Turnpike. The Central Artery provides direct access to all downtown Boston locations including South Station, the Financial District, Government Center and the North Station areas. The Central Artery also provides access to Logan International Airport via the Sumner and Callahan Tunnels and to points north via I-93 and Route 1. The Massachusetts Turnpike provides regional access to the area from Route 128 (I-95) and other areas further west.

As indicated in Figure 1, regional highway access to the area appears efficient and direct; however, congestion on the Central Artery and Southeast Expressway often result in significant delays for traffic. Delays along the regional highway network are especially problematic during peak hour periods. The result is a significant volume of traffic that uses study area roadways to bypass these regional facilities. Local congestion is often exacerbated by this bypass activity of through traffic on local roadways.

Public Transportation

Rapid Transit

The relocation of the Orange Line in 1987, which formally provided service along Washington Street, eliminated a source of convenient, reliable rapid transit service within the area. Currently, bus Route 49 provides temporary replacement service along the Washington Street corridor. Permanent replacement service for the corridor is currently under study by the MBTA and could possibly take the form of either bus or light rail service.

Figure 2 indicates the public transportation facilities serving the South End Medical Area. The closest rapid transit facility to the study area remains the Orange Line with new stations at Ruggles Station, Massachusetts Avenue and Back Bay/South End (Dartmouth Street). The new alignment is located approximately 3/4 of a mile to the north of the former facility and requires significantly longer walking distances, thereby providing limited service to the study area. Employers in the study area provide free shuttle bus services to certain Orange Line stations during the peak hour periods (described in more detail later). Orange Line trains are scheduled at 4 minute frequencies during the peak periods of 7:05 AM to 8:45 AM and between 4:34 PM and 5:52 PM. Headways are every 8 minutes during daytime off-peak hours.

The next closest rapid transit facility is the Red Line at Broadway Station or Andrew Square. These stations lie northeast of the study area and are not within convenient walking distance. Employer shuttle bus service is also provided to these locations. Red Line trains are scheduled every 12 minutes or less between 5:50 AM and 8:58 PM.

Bus Service

As shown in Figure 2, a number of bus routes traverse mostly the southwesterly portion of the study area. No bus service is provided along the northeast part of Albany Street. Bus service in the study area is as follows:

Bus Route 1 - service directly along Massachusetts Avenue from Dudley Square to Harvard Square, scheduled at intervals of ten minutes from 6:47 AM until 8:10 PM. (unless otherwise noted, only peak period schedules are listed, and all buses except for 47A have different off-peak schedules and some hours of operation);

Bus Route 47 - originates at Andrew, travels along Southampton, right on Albany, left on East Newton, and right on Washington Street to Dudley, proceeding through Back Bay on to Cambridge, returning to the South End along Washington Street turning right on East Brookline, then right on Harrison Avenue, left on East Concord (back to left on Albany) then left on Southampton, proceeding to Andrew Station, scheduled every 20 minutes or less between 6:00 AM and 4:00 PM, then on 17-minute intervals between 4:00 PM and 6:00PM.;

Bus Route 8 - travels between Columbia Point and Ruggles Station, through the study area along Massachusetts Avenue between Albany Street and Washington Street, approximately every 30 minutes;

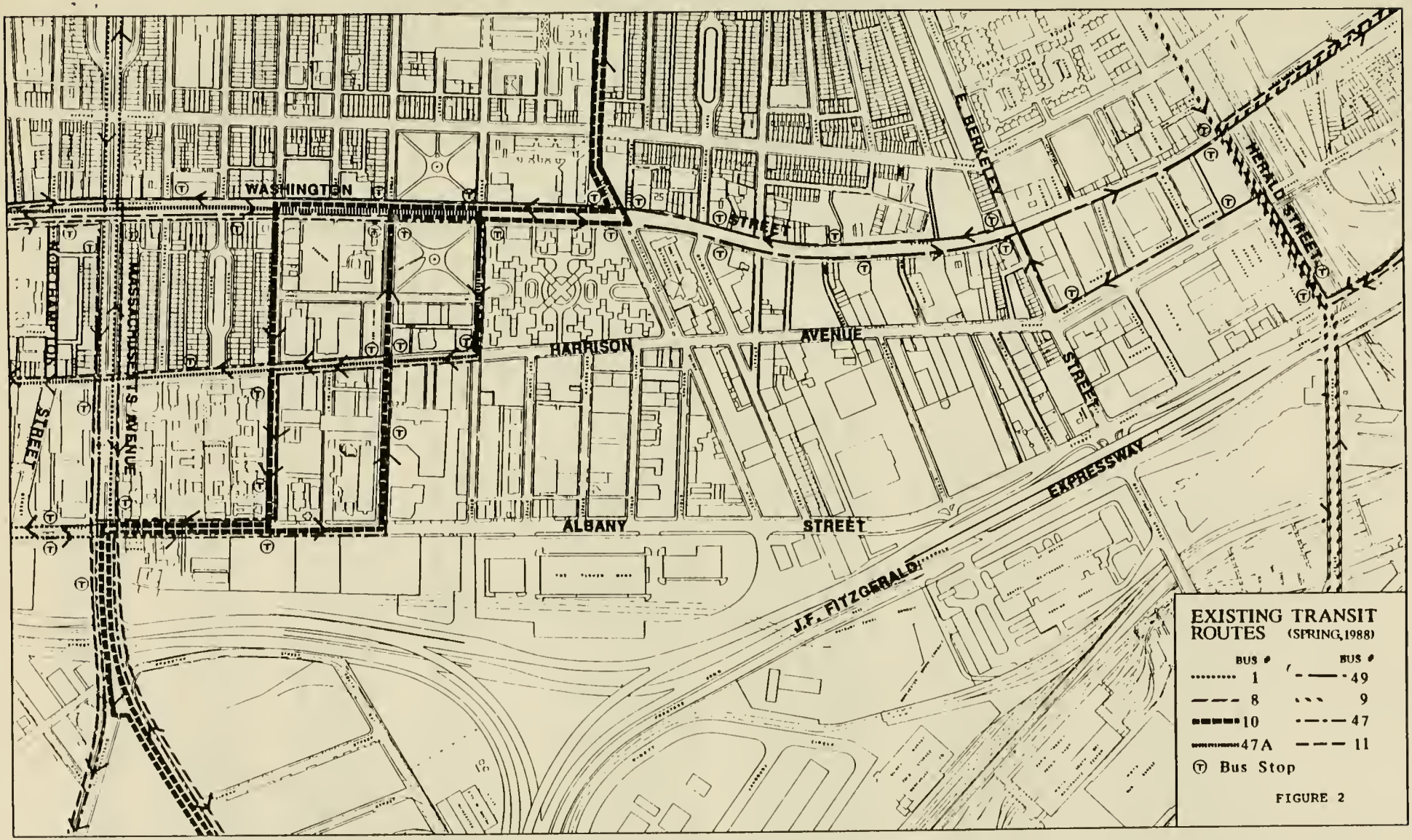

FIGURE 2

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Bus Routes 9 & 11 - serves the study area between Washington and Albany Streets along Herald Street as the #9 travels between City Point and Copley Square (approximately every 10 minutes or less between 6:21 and 9:30 AM and between 1:45 and 5:35 PM.) and the #11 to downtown (scheduled every 6 minutes or less between 6:50 AM and 8:51 AM and every ten minutes or less between 2:48 and 6:15 PM);

Bus Route 10 - travels along Southampton, turns right on Albany then left on to East Newton, right on Washington, then left on West Dedham Street to Copley Square, returning along Washington, left on East Concord, turning left on Albany and another left onto Southampton Street to City Point, operating at 25-minute intervals between 7:00 AM and 8:40 AM, and 1:20 PM and 7:05 PM;

Bus Route 47A - provides service to Boston City Hospital from Kenmore Station, proceeding along Washington from Northampton, turning right down East Brookline, another right and back along Harrison Avenue to Melnea Cass Boulevard, at an average of 10-minute intervals between 6:52 and 8:36 AM and approximately 17-minute intervals between 2:02 PM and 6:00 PM, with no service from 8:36 and 2:02;

Bus Route 49 - travels along Washington Street toward Downtown, returning along Herald Street, turning left onto Harrison Avenue, then left for a block on East Berkeley, back out Washington Street to Dudley Square, scheduled every 6 minutes or less between 6:54 and 9:12 AM and every 8 minutes or less between 3:46 and 6:40 PM. The $.60 T pass allows travel on the Route 49 bus.

Employer Shuttle Bus Services

To encourage transit use and to assist staff in reaching the MBTA's rapid transit stations, several shuttle services are offered by study area employers.

BU Medical Center - provides free peak period shuttle bus service to and from Broadway Station on the Red Line. The buses stop at the two main hospital buildings on East Newton Street. BUMC also provides a 25 percent T Pass subsidy to employees.

Boston City Hospital - operates two weekday shuttle services to area rapid transit stations. BCH provides a shuttle bus to the Ruggles Station on the Orange Line and to the Red Line at Andrew Station.

Dupont - provides peak period shuttle service from the New England Medical Center Station on the Orange Line to and from their facility.

Parking Supply

The total available parking supply in the South End Medical Area is approximately 7,383 spaces. The following presents a breakdown of available parking in the area:

TABLE 1: Parking Supply in the South End Medical Planning Study Area

Type of Parking	Public Spaces	Private Spaces	Total Spaces
Surface Lot	518	3,896	4,414
Garage	780	0	780
On-Street	1,800	389	2,189
Total	3,098	4,285	7,383

Off-Street Parking

The off-street parking inventory in the study area lists 49 parking lots and 2 parking garages. (Refer to Table 2 and Figure 3.) The lots range in size from spaces for 8 cars to 1,250 at BU Medical Center. A total of 5,194 off-street spaces have been inventoried, with 780 of those being in the two garages located at the Harriet McCormack Nursing Tower on Northampton Street (530 spaces) and at the University Hospital Doctors' Office Building on Harrison Avenue (250 spaces).

Of the total number of off-street parking spaces, only 1,298 or approximately 25 percent are available to the public for paid parking. The remaining 3,896 spaces are designated for private use, the majority of which are devoted either to local businesses or medical facilities in the area. These facilities are customarily using additional acreage of private property adjacent to industrial or medical buildings for employee parking. Employee parking is free in most instances, although the BU Medical Center charges $3.00 per day for employee parking in Lot "A" and the Boston City Hospital provides limited garage parking to employees for a $25.00 monthly fee. Only nine of the 45 private lots provide over 100 spaces, with the average number ranging between 20 and 60.

There are eight commercial establishments with adjacent parking providing a total of 143 employee and customer spaces.

FIGURE 3

SOUTH END MEDICAL AREA PLANNING STUDY

Prepared for:
University Hospital

Prepared by:
Robert F. Walsh Associates, Inc.
Howard/Stein Hudson Associates

TABLE 2

OFF-STREET PARKING INVENTORY

MAP #	FACILITY NAME/LOCATION	TYPE	NUMBER OF SPACES PUBLIC	PRIVATE	TOTAL
1	Northampton by Washington	L		46	46
2	H.McCormack Nurs.Twr, Northampton	L		9	9
3	H.McCormack Nurs.Twr, Northampton	G	530		530
4	Digital, Hampden/Albany	L		97	97
5	Mass. by Harrison	L	50		50
6	Boston City Hospital	L		55	55
6A	Boston City Hospital	L		37	37
7	Boston City Hospital	L		25	25
8	BRA lots 11A,11B,11C, E. Concord	L		20	20
9	Franklin Square House	L		15	15
10	Immaculate Conception Church	L		112	112
11	B.U. Med. Ctr., D Lot	L		24	24
12	B.U. Medical Ctr., Talbot Bldg.	L		50	50
13	Fuller Mental Health Ctr.	L		60	60
14	Univ. Hosp. Drs.' Office Bldg.	G	250		250
15	Univ. Hosp., E. Brookline St.	L		25	25
16	Harrison/E. Brookline (BUMC)	L		80	80
17	Dupont, E. Dedham	L		144	144
18	Dupont, E. Dedham	L		112	112
19	Dupont, E. Dedham	L		30	30
20	Harrison/Malden	L		106	106
21	store, Malden/Wareham	L		20	20
22	Albany/Malden	L		44	44
23	store, Savoy/Harrison	L		12	12
24	store, Waltham/Union Park	L		14	14
25	MBTA, Harrison	L		35	35
26	MBTA, Albany/Randolph	L		115	115
27	restaurant, Perry	L		45	45
28	Harrison by Thayer	L		130	130
29	E. Berkley/Shawmut	L	159		159
30	bank, East Berkley/Harrison	L		12	12
31	Westinghouse, Harrison/Traveler	L		49	49
32	factory/store, Harrison/Traveler	L		8	8
33	Kincaid Summerfield, Traveler	L		32	32
34	Fed. Express, Albany/E. Berkley	L		35	35
35	N.E. Telephone, Wash. by Mullins	L		80	80
36	Teradyne, Wash. by Mullins	L		38	38
37	Graybar, Harrison/Traveler	L		72	72
38	Boston Herald	L		275	275
39	Boston Herald	L		13	13
40	Teradyne, Harrison/Mullins	L		10	10
41	Boston Herald	L		15	15
42	Boston Herald	L		38	38
43	Boston Herald	L		60	60
44	Boston Herald	L		20	20
45	Boston City Hospital	L		37	37
46	Boston City Morgue	L		25	25
47	power plant	L		25	25
48	Univ. Hospital, A Lot	L	309		309
49	B.U. Medical Ctr., C Lot	L		1250	1250
50	Flower Exch. Bos.(leased to BUMC)	L		300	300
51	Cathedral Housing Project, B.H.A.	L		40	40
Total			1298	3896	5194

Rates were obtained for the following public facilities:

East Berkeley and Shawmut Avenue Lot: 159 spaces. Rates - $4.00 per day; $1.50 per 1/2 hour.

University Hospital Doctors' Office Building Garage: weekdays - reserved for patients and monthly parkers; nights/weekends/holidays - open to the public. Rates - to 1/2 hour-$1.00; 1/2 hr to 2 hours - $2.00; 2-1/2 to 3 hours - $4.00; 3 to 5 hours - $5.00; 5 to 7 hours - $8.00; 7 to 24 hours - $10.00.

Massachusetts Avenue (at Harrison Avenue) Lot: Rates - $3.00/day (7am-6pm); $2.00 6pm-7am; one hour free parking for visitors to the McCormack Nursing Tower.

Harriet McCormack Nursing Tower (Massachusetts Avenue) Garage: $2.75 each exit or 24 hours; monthly parking card costs $25 for City Hospital Employees and $35 for building tenants (2-3 year waiting list for cards).

University Hospital "A" Lot, Albany Street: Employees/Visitors/Staff open 5:30 AM to 10:30 PM $1.00/hour; $5.00 maximum per day; $5.00 deposit required.

On-Street Parking

As indicated in Figure 4 and in Table 3, there are approximately 2,953 on-street parking spaces within the study area, of which 51% (or 1502 spaces) are unrestricted. Of those, 90% are unmetered, thus available for free public use. Approximately 284 (10%) of the total spaces are restricted for residents only, with another 105 permitted for visitor use. The resident spaces are concentrated mainly along Massachusetts Avenue, East Springfield, East Concord and East Brookline Streets, and Worcester Square between Washington Street and Harrison Avenue.

Spaces which could accommodate approximately 108 vehicles are used by bus stops. Parking is also prohibited in several locations, accounting for 22 percent of curb frontage, or approximately 656 spaces. Only 14 handicapped spaces are provided.

Traffic Flow

Existing Traffic Circulation and Volumes

The majority of traffic traveling to and from, as well as through, the South End Medical Study Area is served principally by the major north-south (Washington Street, Harrison Avenue and

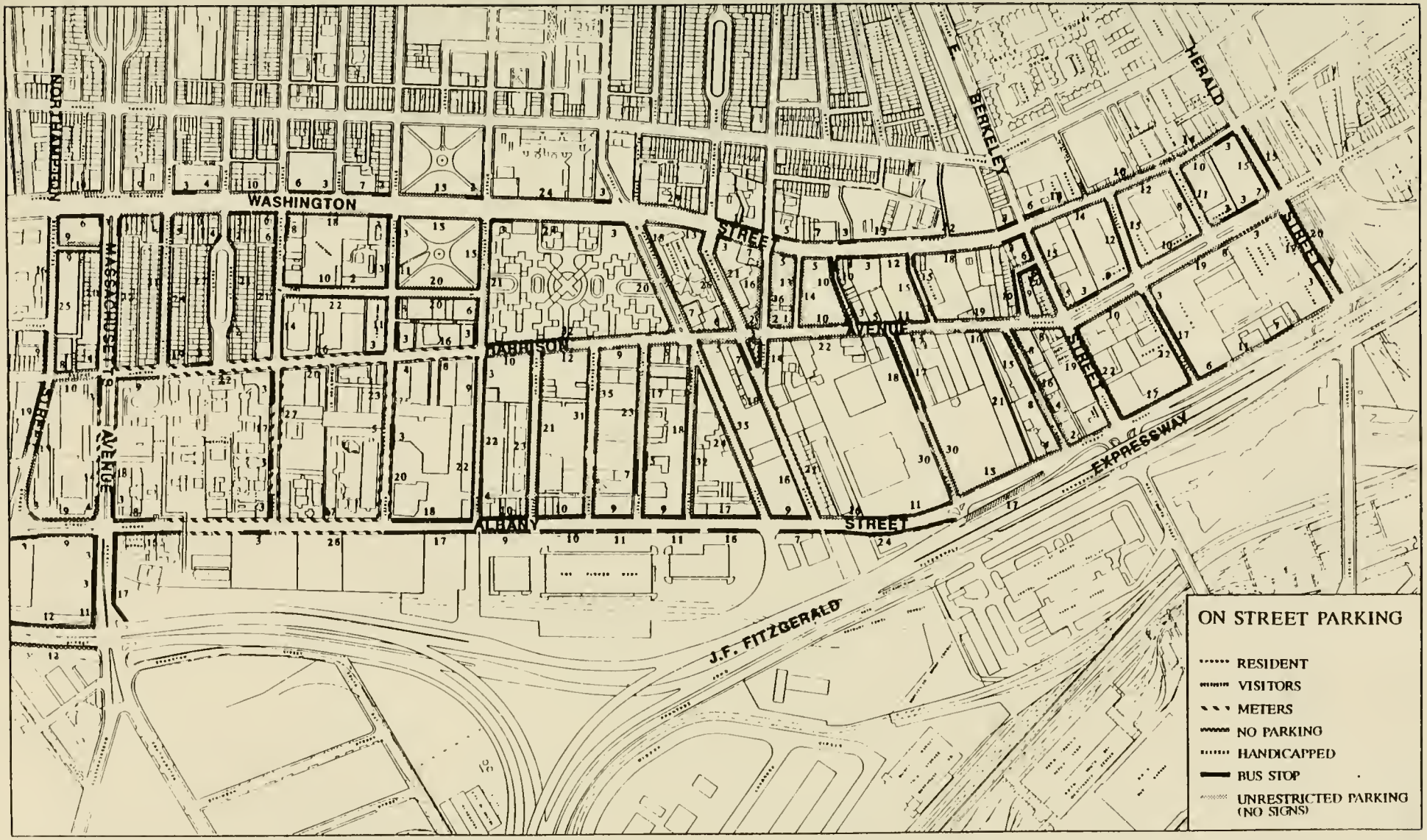

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FIGURE 4

TABLE 3

ON STREET PARKING SUMMARY - STUDY AREA

Street/Block	Number of Spaces							
	Resident	Visitor	Meter	No Parking/ Tow Zone	Unrestr.	Handicapped	Bus Stop	TOTAL
Northampton:								
Washington to Harrison*				9	41			50
Harrison to Albany*					38			38
Massachusetts:								
Washington to Harrison	42	4					6	52
Harrison to Albany			32	4			6	42
Albany to Cass				31			3	34
East Springfield:								
Washington to Harrison	55	10						65
Worcester:								
Washington to Harrison	48	6				2		56
East Concord								
Washington to Harrison	35	14						49
Harrison to Albany			44	5			6	55
East Newton								
Washington to James		24					3	27
James to Harrison		8	11				3	22
Harrison to Albany			43			5	3	51
East Brookline								
Washington to Harrison					42		3	45
Harrison to Albany	44	7			9			60
East Canton								
Harrison to Albany					44			44
East Dedham								
Harrison to Albany					66			66
Plympton								
Harrison to Albany				12	40			52
Monsignor Reynolds								
Washington to Harrison				18	27			45
Wareham								
Harrison to Albany					50			50
Malden								
Harrison to Albany					59			59
Union Park								
Washington to Harrison					47			47
Harrison to Albany*	39			14	10			63
Waltham								
Washington to Harrison					32			32
Harrison to Union Park				7	14			21
Rollins								
Washington to Harrison					27			27
Savoy								
Washington to Harrison				13	10			23
Randolph								
Harrison to Albany				35	60			95
Perry								
Washington to Harrison				15	15			30
Thayer (private way)								
Harrison to Albany	21							21
Paul Sullivan								
Harrison to Albany				27	24			51
Fay								
East Berkley to Harrison				25	6			31
East Berkley								

Washington to Harrison *			5	35			40
Harrison to Albany *			22	19			41
Traveler							
Washington to Harrison				27			27
Harrison to Albany			39	3			42
W. E. Mullins							
Washington to Harrison				19			19
Herald							
Washington to Harrison			30				30
Harrison to Albany			39			6	45
Washington							
Northampton to Mass.				10		6	16
Mass. to E. Springfield				17			17
E. Springfield to Worcester				14		3	17
Worcester to E. Concord			12	3		3	18
E. Concord to E. Newton				35		6	41
E. Newton to E. Brookline				30		3	33
E. Brookline to Msgr. Reynolds				48		9	57
Msgr. Reynolds to Union Park				42			42
Union Park to Waltham				18		3	21
Waltham to Rollins				10			10
Rollins to Savoy				12			12
Savoy to Perry			4	25		6	35
Perry to E. Berkley				40		6	46
E. Berkley to Traveler			6	27			33
Traveler to W. E. Mullins *				22			22
W. E. Mullins to Herald				24		3	27
Parmelee							
Northampton to Mass.			9	9			18
Father Francis J. Gilday							
E. Concord to E. Newton	32		2				34
James St.							
E. Newton to E. Brookline				40			40
Harrison							
Northampton to Mass.				18			18
Mass. to E. Concord *		41	9			3	53
E. Concord to E. Newton		36				3	39
E. Newton to E. Brookline		24			4		28
E. Brookline to Msrg. Reynolds				68			68
Msrg. Reynolds to Union Park				11			11
Union Park to Waltham				5			5
Waltham to Randolph			7	33			40
Randolph to E. Berkley			11	54			65
E. Berkley to Traveler				18		3	21
Traveler to Herald			3	36	3	3	45
Albany							
Hampden to Mass.			18			6	24
Mass. to E. Newton		53	23			3	79
E. Newton to E. Brookline			35				35
E. Brookline to E. Canton			19				19
E. Canton to E. Dedham			20				20
E. Dedham to Plympton			20				20
Plympton to Wareham			20				20
Wareham to Malden			33				33
Malden to Union Park			16				16
Union Park to Randolph			35	16			51
Randolph to Thayer				32			32
Thayer to Sullivan				4			4
Sullivan to E. Berkley				2			2

E. Berkley to Traveler				17				17
Traveler to Herald				13	11			24
Melnea Cass								
Northampton to Mass.				24				24
TOTAL	284	105	284	706	1498	14	108	2999

Albany Street) and east-west (Melnea Cass, Massachusetts Avenue, Malden Street/Monsignor Reynolds Way/West Dedham Street, East Berkeley Street and Herald Street) roadways. (Refer to Figure 5.) The one-way street pattern on the remaining streets in the study area does not lend itself to any other but local traffic. A summary of the average weekday traffic volume levels along study area roadways is given in Table 4 and Figure 6.

The volume of traffic using streets in the study area is identified using screenlines, or locations where all traffic must cross to either enter or exit the area. Two screenlines for north-south traffic have been defined: north of Massachusetts Avenue and south of East Berkeley Street. East-west traffic has been identified along a screenline just west of Harrison Avenue.

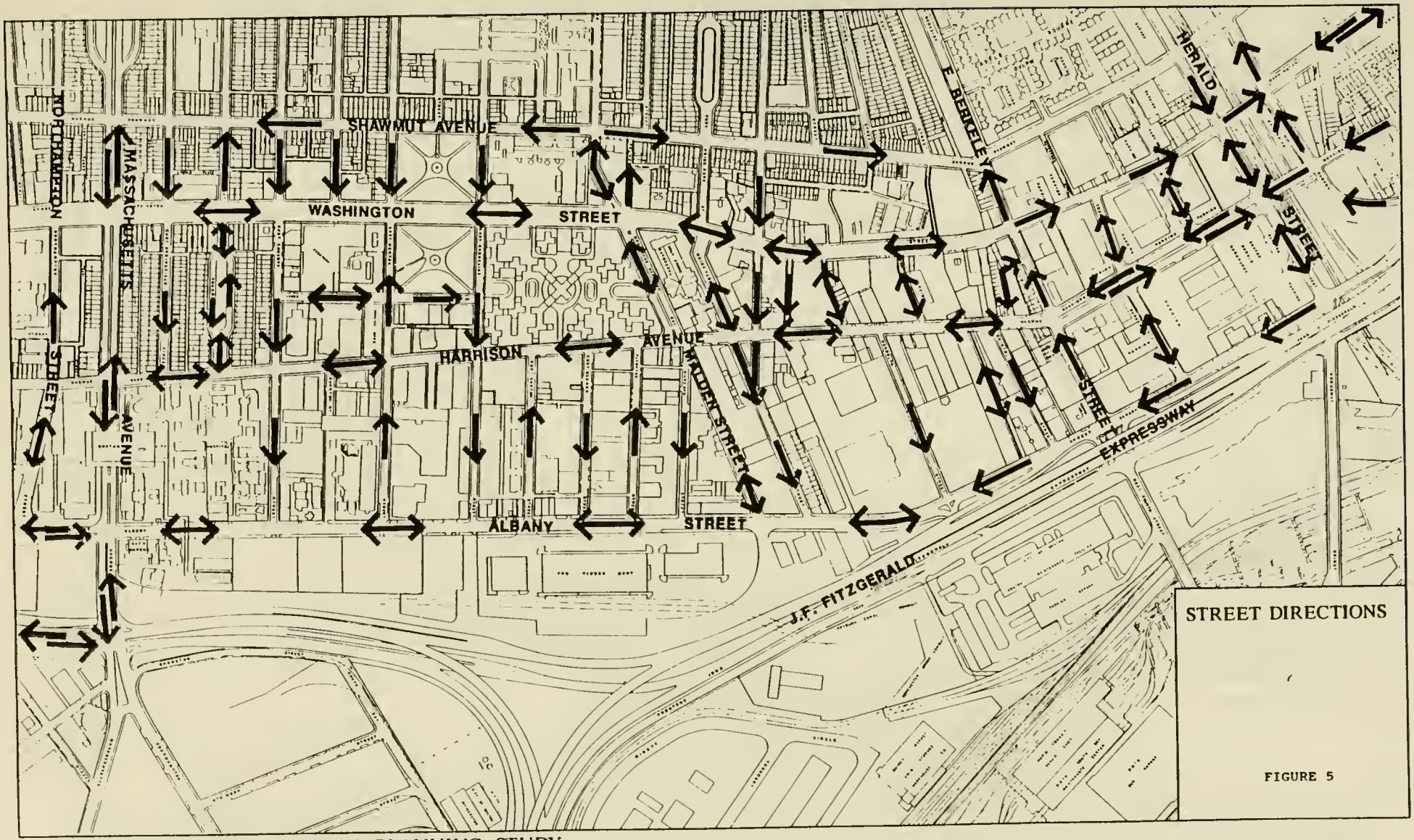
North-south traffic is heavier within the southern portion of the study area around Massachusetts Avenue than in the north at East Berkeley Street. At Massachusetts Avenue, Albany Street carries a significantly larger portion of north-south traffic at approximately 39 percent than Harrison Avenue (26 percent), although only slightly more than the 35 percent along Washington Street. At East Berkeley Street, Harrison Avenue and Albany Street serve an equal percentage of north-south traffic (39 and 38 percent, respectively), while Washington Street carries significantly less north-south traffic at approximately 23 percent, because it becomes one-way northbound between Berkeley Street and Herald Street.

Massachusetts Avenue serves the dominant portion of east-west traffic in the study area at just over 35 percent of all vehicles. Herald Street serves the next largest portion of east-west traffic at over 29 percent. East Berkeley Street, which is one-way through the area, serves approximately 13 percent of east-west traffic, although when combined with Herald Street, this east-west pair serves over 42 percent of all east-west traffic in the study area. The West Dedham Street/Monsignor Reynolds Way/Malden Street east-west connector serves a modest amount of east-west traffic at close to 10 percent.

Local vs. Through Traffic

Study area roadways that are used as major cross-town connectors include Melnea Cass Boulevard, Massachusetts Avenue, East Berkeley Street and Herald Street. Other local roadways that are used to a lesser extent by through traffic include the Dartmouth Street/West Dedham Street/Monsignor Reynolds Way/Malden Street and the Clarendon Street/Waltham Street connections.

Washington Street, Harrison Avenue and Albany Street are the major roadways providing direct local access to the study area. These facilities are also used by a significant amount of through



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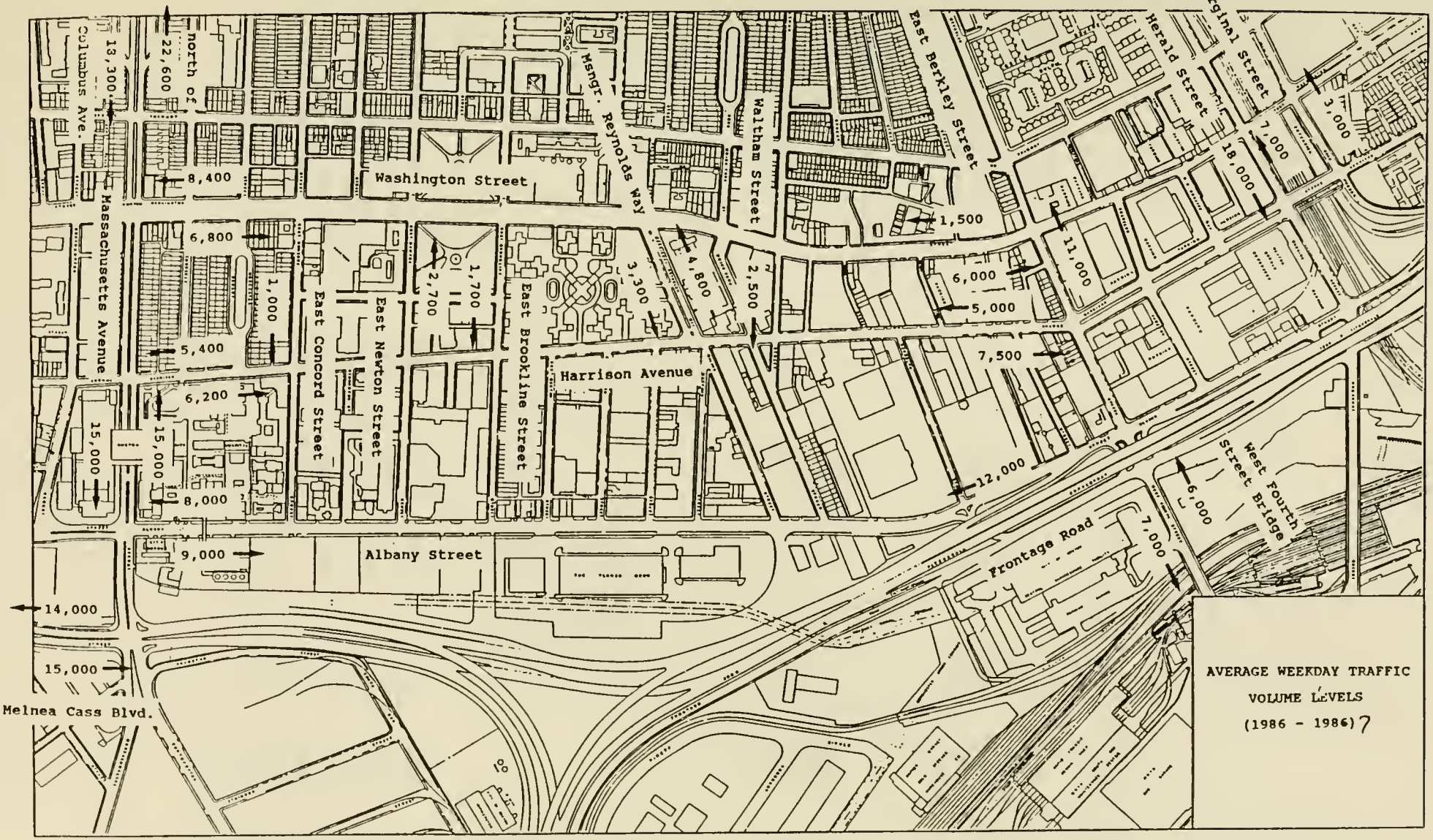

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FIGURE 6

TABLE 4

SOUTH END MEDICAL AREA PLANNING STUDY:
Summary of Average Weekday Traffic Volume Levels (1986 - 1987)

	Average Weekday Traffic (1986 - 1987)					
	Northbound	Percent	Southbound	Percent	Total	Percent
North of Massachusetts Avenue at:						
Albany Street	9,000	40.9%	8,000	36.7%	17,000	38.8%
Harrison Avenue	6,200	28.2%	5,400	24.8%	11,600	26.5%
Washington Street	6,800	30.9%	8,400	38.5%	15,200	34.7%
Total	22,000		21,800		43,800	
South of East Berkley Street at:						
Albany Street	0	0.0%	12,000	64.9%	12,000	37.5%
Harrison Avenue	7,500	55.6%	5,000	27.0%	12,500	39.1%
Washington Street	6,000	44.4%	1,500	8.1%	7,500	23.4%
Total	13,500		18,500		32,000	

	Average Weekday Traffic (1986 - 1987)					
	Eastbound	Percent	Westbound	Percent	Total	Percent
West of Harrison Avenue at:						
Massachusetts Avenue	15,000	36.1%	15,000	34.5%	30,000	35.3%
East Concord Street	1,000	2.4%	0	0.0%	1,000	1.2%
East Newton Street	0	0.0%	2,700	6.2%	2,700	3.2%
East Brookline Street	1,700	4.1%	0	0.0%	1,700	2.0%
Msgr. Reynolds Way	3,300	8.0%	4,800	11.0%	8,100	9.5%
Waltham Street	2,500	6.0%	0	0.0%	2,500	2.9%
East Berkley Street	0	0.0%	11,000	25.3%	11,000	12.9%
Herald Street	18,000	43.4%	7,000	16.1%	25,000	29.4%
Marginal Street	0	0.0%	3,000	6.9%	3,000	3.5%
Total	41,500		43,500		85,000	

traffic avoiding the Central Artery/Southeast Expressway congestion during peak travel periods. The directional pattern of local streets between Washington and Albany Streets was designed with the participation of local residents and arranged to discourage through traffic. As depicted in Figure 5, the one-way street pattern in the area provides little opportunity for through access and deliberately makes travel through the area confusing and inefficient.

The amount of through traffic can be estimated as the difference between the amount of traffic generated to the available parking supply (around 7,400 spaces, assuming an average daily parking turnover rate of 1.3) and the total daily traffic crossing screenline locations. Screenline locations for this analysis were adjusted to reflect the entire study area (north of Herald Street, south of Melnea Cass Boulevard, east of Albany Street and west of Washington Street). Analysis indicates that traffic destined for the study area (approximately 19,000 vehicle trips per day) comprises approximately only 12% percent of the total traffic crossing the screenline locations -- about 166,000 vehicle trips per day.

Further analysis indicates that even when these screenlines are drawn closer to the South End Medical Area (north of Monsingor Reynolds Way and south of Massachusetts Avenue) the percentage of local traffic crossing these locations remains low at 11,600 trips per day, or approximately 13% percent of the total traffic of 87,238. The percent of local traffic increases to 24% percent (of 49,280 trips/day) if the screenlines are drawn such that they do not include any major north-south connector (south of Monsignor Reynolds Way and north of Massachusetts Avenue).

The conclusion is that it is through traffic, particularly north-south traffic, rather than locally generated traffic, that is the main contributor to traffic volumes, and congestion, within the study area.

Problem Locations

The locations in the study area that operate with capacity deficiencies are generally those along the major east-west connectors which handle the larger traffic volumes. Massachusetts Avenue, especially the intersections with Melnea Cass Boulevard and Albany Street, operates at an unacceptable level of service during peak hour periods. In addition, congestion west of the study area along Massachusetts Avenue can affect operations between Washington Street and Melnea Cass Boulevard.

Other locations which exhibit poor traffic operations include East Berkeley Street and Herald Street in the vicinity of Albany Street and the Southeast Expressway. The remaining locations in the study area generally operate at acceptable levels of service during all time periods.

Pedestrian Activity

The highest volume of pedestrian activity in the study area is concentrated in the vicinity of the Boston City Hospital, Boston University Medical Center and the University Hospital. Pedestrian activity is highest in areas internal to each institution and along those public streets (East Concord Street and East Newton Street) that tend to bisect the campuses.

Pedestrian traffic in the area is heaviest along Albany Street adjacent to the larger parking facilities serving the South End Medical Area institutions and along Albany Street between East Newton Street and Massachusetts Avenue. East Concord Street and East Newton Street between Albany Street and Harrison Avenue also exhibit high pedestrian activity for the area.

Harrison Avenue in the vicinity of East Brookline Street and East Concord Street exhibits moderate pedestrian activity. Pedestrian traffic crossing Massachusetts Avenue is influenced by the footbridge connecting portions of the Boston City Hospital above Massachusetts Avenue between Harrison Avenue and Albany Street.

EMPLOYEE AND VISITOR TRAVEL PATTERNS

Trip Distribution

The multitude of institutional and commercial uses that exist in the South End Medical Area prove it difficult to establish definitive trip distribution assumptions for all employee and visitor travel patterns to and from the area. As documented by recent employee and patient surveys of the larger institutions in the area (Boston City Hospital, Boston University Medical Center and University Hospital), each land use appears to draw employees from differing, although not completely dissimilar, home origins. The travel corridors shown in Figure 7 (defined as those used by the Central Transportation Planning Staff) are used to establish trip distribution patterns over the transportation network to and from the area.

Table 5 compares employee home origin by travel corridor for Boston University Medical Center/University Hospital (BUMC/UH) and Boston City Hospital (BCH). Eight travel corridors have been defined, including the core area and travel originating from areas external to the CTPS corridor definitions. From these surveys, the highest concentration of BUMC/UH employees is in the west, generally along the Massachusetts Turnpike, followed by the south. The highest concentration of employees at BCH is within the core area (Boston, Brookline and Cambridge), within easy access of mass transit, followed by the south.

These trip distributions are further compared to the travel corridors used by all employees to and from the City of Boston as a whole in Table 6. This analysis indicates that the travel corridors used by South End Medical Area (BUMC/UH and BCH) employees are similar those of the City of Boston as a whole, although biased somewhat towards the south and west. Generally, trip distribution characteristics of employees traveling to the urban core but not to the downtown area exhibit biases along travel corridors with easier access.

Table 7 further identifies the percent of employee auto drivers as distinguished by total daily population auto drivers for BUMC/UH, as distributed by travel corridor. For employees, the distribution generally follows that of the population as a whole, with a slightly higher proportion of employees driving from the west and south than of the total daily population. The breakdown of BCH employee drivers was not available, although it should follow the same pattern as that for the BUMC/UH total daily population.

FIGURE 7: TRAVEL CORRIDORS

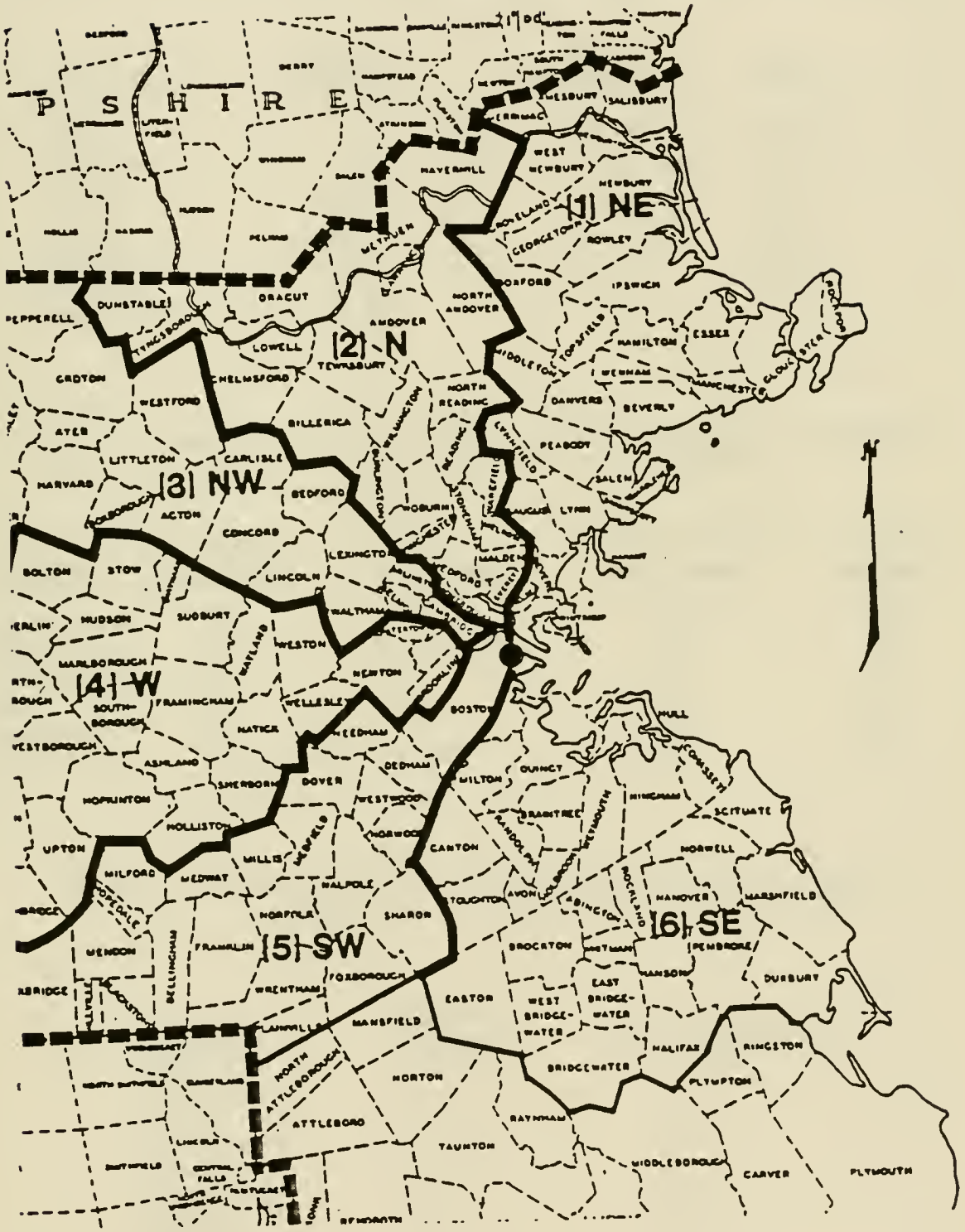

TABLE 5: BUMC/UH AND BCH EMPLOYEE HOME ORIGINS BY CORRIDOR

Corridor	BUMC/UH Employees	BCH Employees	Total
Core	4.3%	34.2%	16.4%
Northeast	9.4	3.6	7.1
North	9.2	8.8	9.1
Northwest	10.3	2.9	7.3
West	26.7	8.5	19.4
Southwest	14.2	13.3	13.9
South	22.9	21.0	22.1
External	2.8	7.7	4.8

TABLE 6: BUMC/UH AND BCH EMPLOYEE HOME ORIGIN BY CORRIDOR COMPARED TO CITY OF BOSTON

Corridor	BUMC/UH Employees	BCH Employees	BUMC/UH & BCH Employees	City of Boston
Northeast	10%	6%	9%	14%
North	10	15	11	12
Northwest	11	5	9	10
West	29	15	25	17
Southwest	15	23	18	22
South	25	36	28	25

TABLE 7: PERCENTAGE OF BUMC/UH AUTO DRIVERS BY CORRIDOR COMPARED TO TOTAL BUMC/UH POPULATION

Corridor	BUMC/UH Drivers	BUMC/UH Ttl Population
Core	2.6%	4.3%
Northeast	9.0	9.4
North	8.3	9.2
Northwest	10.2	10.3
West	28.4	26.7
Southwest	14.0	14.2
South	25.2	22.9
External	2.4	2.8

Mode Use

Mode use information for South End Medical Area employees and visitors derived from surveys of employee work travel and patient travel at Boston City Hospital, Boston University Medical Center and University Hospital is indicated in Table 8. (It should be noted that at the time of the survey for BUMC and UH, the Orange Line provided transit service along the Washington Street corridor while the BCH survey was taken after the Orange Line rapid transit service was replaced with bus service.)

TABLE 8: MODE TO WORK FOR SOUTH END MEDICAL AREA EMPLOYEES AND VISITORS

Location	Drive Alone	Carpool/ Dropoff	Transit	Walk or Other
Boston University Medical Center	58%	9%	28%	5%
University Hospital	65%	7%	22%	6%
Boston City Hospital staff	76%	2%	13%	9%
BCH Visitors	35%	18%	26%	21%

The data indicate that auto use to and from the area is the dominant mode choice for employee work travel and visitor travel (between 58 and 76 percent for employees, and 35% for BCH patients). Transit use at between 13 and 28 percent accounts for the next most significant mode share for employee work travel to the area.

BCH has an overall higher proportion of auto users than BUMC and UH, in spite of the fact that a higher proportion of its employees live within the area best served by transit. The low percent of transit use for employee work travel to BCH is thought in most part to be due to its free parking policy, and partially also due to the loss of convenient rapid transit service to the area. The loss of convenient Orange Line service may well have resulted in a reduction in transit use for BUMC and University Hospital employees, patients and visitors as well. This is particularly true for BUMC/UH, where over one-third of transit riders had used the Orange Line as their only or final transit mode to reach the hospital. Of Orange Line riders identified in a 1986 survey, only 7% used only the Orange Line, and 81% had transferred to the Orange Line from other lines (Table 9). The

TABLE 9: TRANSIT AND BUS LINES USED
BY BUMC/UH SURVEY RESPONDENTS, FALL, 1986

Transit/Bus Lines Used	Number	%
Bus Only	64	24
One bus - no transfer	35	13
Transfer from other bus	29	11
Bus Transfer from Transit	89	33
From Red Line (BUMC Shuttle)	63	24
Red Line only	21	8
from Feeder Bus	16	6
from South Station	14	5
from Green Line	2	1
from Orange Line	2	1
from Plymouth & Brockton bus	1	*
From Green Line	21	8
From Orange Line	5	2
Red Line	7	3
Only Red Line	2	1
Transfer from Orange Line	4	2
Transfer from Green Line	1	*
Green Line Only	1	*
Orange Line	97	36
Only Orange Line	18	7
From bus	24	9
From Red Line	21	8
From North Station	19	7
From Green Line	7	3
From Blue Line	7	3
From Commuter Boat	1	*
South Station Only	1	*
No Answer	6	2
TOTAL	266	100%

* = less than 1% of total responses

bus service on Washington St. would only be a direct replacement for the 7% of transit riders who who had used only the bus. The 81% who had previously transferred to the Orange Line would either have an extra bus transfer or a changed transfer to the Red Line to reach the area. For BCH, under "post-Orange line relocation" conditions, about half the transit riders come by bus, one-third by Orange Line, and 16% by Red Line.

Parking Demand

Recent parking studies for the Boston City Hospital and BUMC/UH indicate that overall parking accumulation in the area is at or beyond capacity from between 11:00 AM and 3:00 PM. The study also indicates that parking demand acctually peaks in the early afternoon around 1:00 - 2:00 PM. This patten is typical for a hospital area, due to the overlap of shifts around mid-afternoon.

While there is a theoretical parking deficit in the early afternoon, this is met by on-street parking, which accounts for 10 percent of hospital employee parking for Boston University Medical center and Boston City Hospital. As indicated above, around 1,500 on-street spaces within the study area are unrestricted at the present time. This free on-street supply helps accommodate overflow demand from the lots and garages within the study area. In addition, many of the lots are unmarked, and some are unpaved. Thus, illegal parkers can raise uttilization rates at these facilities above the legal capacity.

PROBLEMS AND OPPORTUNITIES

Long Term Needs

The South End, and in particular the South End Medical Area, will continue to face both private and public development pressures that will alter current land use and foster improved transportation access. New development will increase traffic and parking demand and utilize land now used for surface parking. Future land use changes in the area will also necessitate improved transit access to the area.

Accommodation of the transportation access needs of new development demands in the area will require several approaches: increased parking supply, improved transit access and transportation systems management.

Parking Supply - New development will utilize many of the existing surface parking lots, thereby decreasing the already fully utilized existing parking supply. Parking supply in the area will need to be accommodated through the construction of more structured parking. Parking rates in the area will need to increase to reflect the cost of these more expensive type of parking facilities. On-street spaces should also be more effectively regulated to help meet parking needs, particularly for short-term parking.

Transit Service - Transit service to the area will have to be improved to accommodate increased work travel to, and decreased parking within, the area. A key link in provision of good transit service to the area is the Washington Street replacement service. Area residents and institutions should work for replacement service that will provide direct links to the rapid transit and commuter rail network. In the short-term, amenities and safety for transit and bus riders should be a priority in urban design for the area.

The currently proposed high occupancy vehicle (HOV) lanes on the Southeast Expressway from the Massachusetts Avenue ramps to the Central Artery, South Station and the Third Harbor Tunnel should be used to their fullest to provide connections to these areas. In addition, the impacts of the once proposed connector from South Station to Ruggles Station along the transit easement adjacent to Melnea Cass Boulevard should be assessed.

Transportation Systems Management - The use of parking disincentives and transit incentives should be assessed to reduce auto use and related parking demand to the area. These initiatives should be coordinated through one repre-

sentative for all institutions in the area so as to be most effective. In the Longwood Medical Area, the Medical Area Service Corporation (MASCO) was formed by the medical and educational institutions to coordinate transportation, daycare, security, and other areawide services. The SETSA group could effectively serve such a role for the South End Medical Area.

Major Projects in the Area

Several major public and private projects that will have an impact on the area are currently in the planning stages. The following describes land use and transportation network changes challenging the area.

Private development plans of the hospitals and other institutions, particularly the SETSA development east of Albany Street, will add activity to the area. City attitudes toward conversion of buildings in industrially zoned areas to offices and residences are changing. Questions exist as to how the existing zoning or various zoning changes may affect future travel patterns, traffic flows and parking demands.

The planned **Central Artery/Third Harbor Tunnel** project will dramatically improve access from the area to downtown Boston, South Station and Logan International Airport. (Refer to discussion following.) The most recent configurations for ramp connections at the Massachusetts Avenue interchange will dramatically improve regional access to the area. Construction period impacts are also of concern.

The **relocated Orange Line** along the Southwest Corridor alignment has changed transit access to the area. Meanwhile, other projects such as the Washington Street replacement service and the longer-term Circumferential Transit Corridor are still under study. The various transit options have different implications for development in the area and for transit access to it.

Plans for the relocation of the **Suffolk County Correctional Institution** in the Newmarket area will have impacts on the area in terms of access. Access to this facility and the adjacent area are planned in conjunction with the Central Artery/Third Harbor Tunnel project via an at grade intersection with the Massachusetts Avenue ramps to the Southeast Expressway opposite the South End Medical Area.

Development plans in the **Newmarket** area, **Ruggles Station** area (Parcel 18 and Parcel 22 etc.) and redevelopment of **Dudley Square** will increase traffic along Massachusetts Avenue and Melnea Cass Boulevard and promote general transit improvements along the Washington Street and Circumferential Transit corridors.

The **Back Bay Transportation Study** about to commence and the **Prudential Center redevelopment** may result in changes to travel patterns to the northwest of the study area.

Central Artery/Third Harbor Tunnel

Figure 8 illustrates the currently proposed Central Artery/Third Harbor Tunnel project and how it affects the South End Medical Area. The most direct link of the highway project into the study area will be via reconstructed Massachusetts Avenue ramp connections. As proposed, the ramps connecting Massachusetts Avenue to the Southeast Expressway will be replaced with a surface street providing connections to a raised Southeast Expressway via a pair of frontage roads and access ramps. These frontage roads will also be accessible via an extended Union Park Street.

HOV lanes will be provided down the center of the Southeast Expressway to the Central Artery, South Station and the Third Harbor Tunnel. These ramps will be directly accessible via the new Massachusetts Avenue interchange with the Southeast Expressway.

An at grade intersection is currently proposed along the Massachusetts Avenue connector to the Southeast Expressway that will provide access to the Suffolk County Correctional Institution. The location of this intersection is opposite East Concord Street in the South End Medical Area.

The South Boston bypass/seaport access road will also be accessible via the Massachusetts Avenue connector and the frontage roads.

The City of Boston is currently proposing a pair of entrance and exit ramps connecting the Back Bay/South Cove area directly to the Massachusetts Turnpike. As currently proposed, an eastbound on-ramp would be constructed at Tremont and Arlington Streets and a westbound off-ramp will be constructed at Berkeley Street. This proposal would require the elimination of the existing westbound on-ramp at Arlington Street. Inherent in this proposal are surface street improvements along Herald Street and Marginal Road. (It should be noted that the current Massachusetts Department of Public Works proposal for this area is limited to improvements in surface street connections to the Southeast Expressway.)

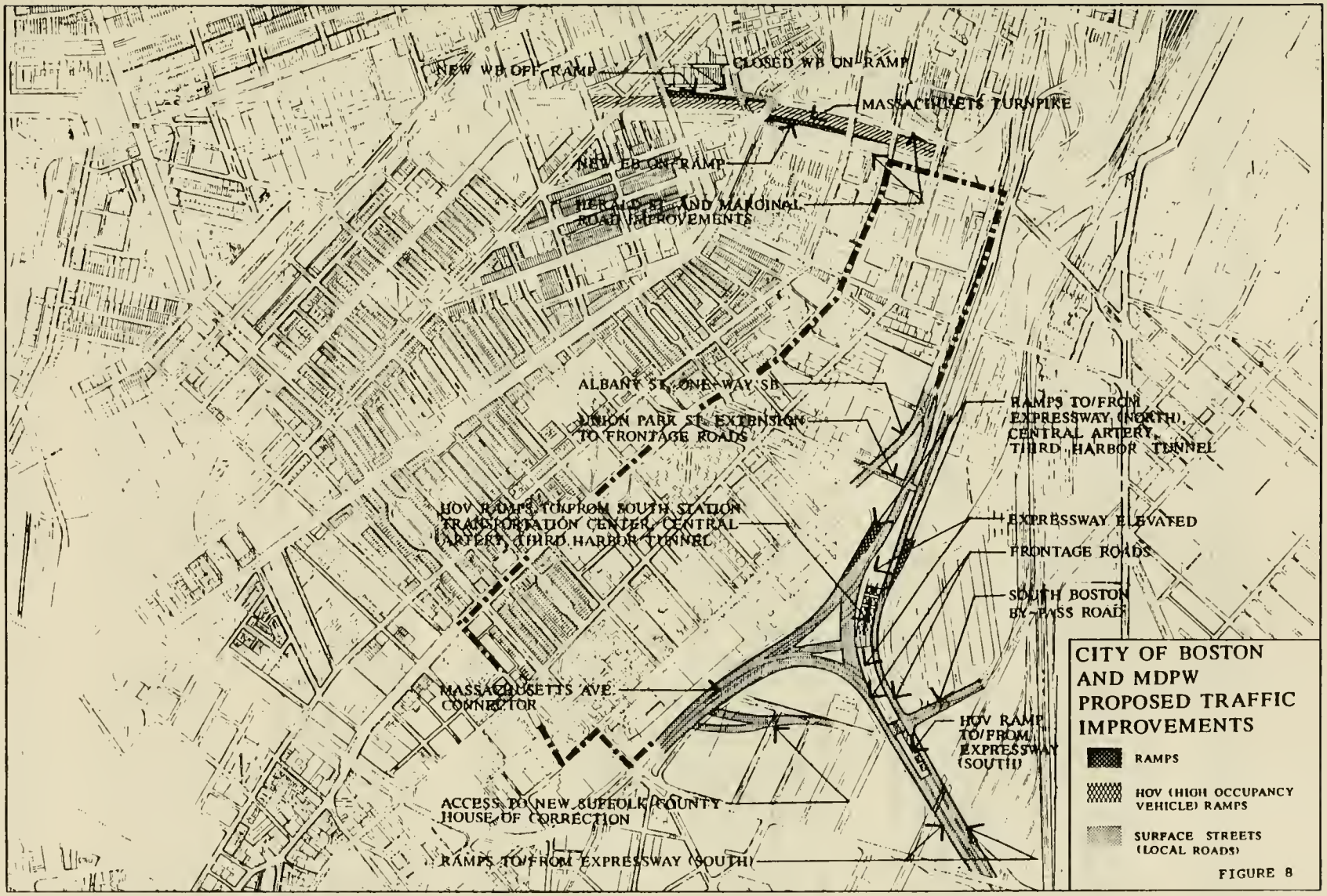
NEW WB OFF-RAMP
CLOSED WB ON-RAMP
MASSACHUSETTS TURNPIKE
NEW EB ON-RAMP
HERALD ST. AND MARGINAL ROAD IMPROVEMENTS
ALBANY ST. ONE-WAY SB
UNION PARK ST. EXTENSION TO FRONTAGE ROADS
RAMPS TO/FROM EXPRESSWAY (NORTH), CENTRAL ARTERY, THIRD HARBOR TUNNEL
HOV RAMPS TO/FROM SOUTH STATION TRANSPORTATION CENTER, CENTRAL ARTERY, THIRD HARBOR TUNNEL
EXPRESSWAY ELEVATED
FRONTAGE ROADS
SOUTH BOSTON BY-PASS ROAD
MASSACHUSETTS AVE. CONNECTOR
HOV RAMP TO/FROM EXPRESSWAY (SOUTH)
ACCESS TO NEW SUFFOLK COUNTY HOUSE OF CORRECTION
RAMPS TO/FROM EXPRESSWAY (SOUTH)
CITY OF BOSTON AND MDPW PROPOSED TRAFFIC IMPROVEMENTS
RAMPS
HOV (HIGH OCCUPANCY VEHICLE) RAMPS
SURFACE STREETS (LOCAL ROADS)

FIGURE 8

SOUTH END MEDICAL AREA PLANNING STUDY

Prepared for:
University Hospital

Consultants:
Robert F. Walsh Associates, Inc.
Howard/Stein-Hudson Associates

Following are various aspects of the Central Artery/Third Harbor Tunnel project that pose potential problems and/or opportunities for the South End Medical Area and its master plan.

The construction of the Central Artery/Third Harbor Tunnel project, particularly the HOV lanes from the Massachusetts Avenue interchange with the Southeast Expressway to downtown Boston, South Station and the Third Harbor Tunnel connection to Logan International Airport, will enhance regional access to the project area.

Direct two-way connections are provided into a dedicated HOV lane serving the Central Artery, South Station Transportation Center and the Third Harbor Crossing. The potential to tie shuttle services into the South Station garage and the airport merits examination.

The proposed intersection along the Massachusetts Avenue connector providing access to the Suffolk County Correctional Institution site has implications for the development of other portions of this area. In addition, the relationships of the connection with the South End Medical Area warrant further investigation and discussions with the City and the State.

The connections proposed for Union Park Street and the frontage roads may pose conflict with South End residents interests and, therefore, consideration should be given to an alternative connection via Malden Street.

Currently, the proposal provides no net loss of surface parking, an important concern given present and future parking demands.

Although the Central Artery/Third Harbor Tunnel proposal provides no direct relief for the Massachusetts Avenue/Albany Street intersection, reduced congestion on the Central Artery should help the entire Massachusetts Avenue corridor. Another connection to Albany Street, possibly in conjunction with access to the Suffolk County Correctional Institution, needs to be investigated.

Possible traffic impacts throughout the construction period could have severe effects considering the already substantial amount of existing bypass or through traffic in the area. Mitigation of these impacts should be an ongoing process and be an active part of the South End Medical Area institutions.

These and related problems and opportunities pertinent to the transportation elements of the master plan will be examined in more detail in the next phase of work.

QUESTIONS FOR DISCUSSION

To address the problems and opportunities outlined above, the South End Medical Area planning group needs to define its position and agenda regarding a number of issues. Following is a list of discussion questions in the area of transportation based on the findings of Phase I of the South End study. These questions are presented as a guideline for setting priorities for analysis and achieving consensus on policy directions as the study moves into Phase II.

Parking

The existing parking supply, primarily in surface lots, is underpriced for today's market. This is evidenced primarily by the high auto use of Boston City Hospital employees, who are given free parking, even though many live in core neighborhoods which are convenient to transit. In future, the new Central Artery Mass. Ave. ramp construction and new developments will usurp surface lots, at the same time as employee/visitor demand will increase. Some combination of the following types of solutions must be agreed upon by the group:

- finding cooperative solutions for construction period parking shortages. The State will cooperate in this effort as part of Artery impact mitigation;

- providing on-site structured parking and raising rates rates to cover the capital costs and operating expenses;

- finding fringe locations, (again, with the help of the State as part of Artery construction mitigation), to accommodate lower-priced employee parking;

- working with the City to regulate the on-street supply to meet the goals of area employers and residents; and

- implementing strategies, individually and jointly, to more aggressively encourage transit use by employees.

Transit

The current bus services on Washington St. as well as the bus connections to transit, are not adequately serving the area. The group must decide on:

- whether and, if so, how strongly, to advocate light rail options and a direct Central Subway connection for Washington St replacement service;

- the desirability of joining forces to provide coordinated shuttle services to the Red and Orange Lines;

- what benefits for the area are likely to come from the proposed circumferential transit service alternatives, and how strongly this project should be sought; and

- what opportunities are afforded by the new High Occupancy Vehicle lanes proposed for the new Central Artery both for shuttle services and new MBTA services.

New Development Impacts

Because through traffic is such a major contributor to current traffic congestion, the relief afforded by the Artery project will alleviate many current problems. Today, development within the study area accounts for only around 12% of traffic flow. Thus, parking demand, not traffic impacts, will probably be the biggest controlling factor in determining the nature and extent of new development within the study area. In addition, major developments outside the study area such as the new jail, the Parcel 18 and Back Bay development projects will change the nature of through traffic. The relationship of new developments to these outer activity centers will be important in affecting future travel patterns.

Regional Access and Traffic Circulation

The proposed changes to the Mass. Ave. ramps for the Southeast Expressway will dramatically improve auto access to the area, as well as reducing traffic congestion on the local streets. The group must clarify its position on several outstanding design questions prior to submittal of the Supplemental Final Environmental Impact Statement next spring, including:

- Should access to the new Mass. Ave. connector be provided at Union Park Street, as shown in the current design, or at Malden Street, which has been the preferred through traffic connection in South End plans to date?

- Is the "Mass. Ave. Connector" design as proposed the best possible configuration based on land use and access considerations?

- Should a direct connection be provided via the Mass. Ave. connector from the South Boston Bypass road to Cass. Blvd.? What implications would this connector have for our area? Would elimination of the "dogleg" connection in the current plans be desirable?

- What are the land use and design implications of the new surface connections from our area across the new Mass. Ave. connector to the Southampton/Newmarket area, especially regarding the proposed jail?

- How much traffic relief will the new Artery scheme provide for this area? Can circulation or roadway use changes be made as a result which will enhance the area's image, pedestrian amenity? Will the traffic relief make the area even more desirable for high density development?

- Can signal progression and low cost physical changes be made to Mass. Ave. and Cass. Blvd. in the short term which enhance their ability to carry traffic around the study area?

A clear sense of direction from the group, and close, continuing coordination with the State and the City on the Artery project is imperative.

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